SWADAPT1 : Evaluation on standardised circuits of the interest of a robotic module for assisting the driver of an electric wheelchair: pilot, prospective, controlled, randomised study

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SWADAPT1 : EVALUATION ON STANDARDISED CIRCUITS OF THE INTEREST OF A ROBOTIC MODULE FOR ASSISTING THE DRIVER OF AN ELECTRIC WHEELCHAIR: PILOT, PROSPECTIVE, CONTROLLED, RANDOMISED STUDY

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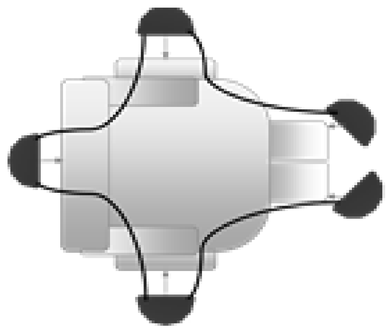
- Most people with disabilities require assistance and often use a technical mobility aid.
- Prevalence of people using wheelchairs = increase with an estimate ranging from 60 to 200 per 10,000 inhabitants (Vignier 2008).
- 10% of wheelchair users use electric models (Kaye 2002; Vignier 2008)
- 25% of accidents with Power Wheelchair (PWC) (Kirby 1995).
- 100 000 accidents involving wheelchair users in the United States in 2006,
- 54.7% of subjects reported having had at least 1 accident in the last 3 years (Chen 2011).



a prototype anti-collision system based on Infra Red technology and algorythms for a low cost solution

OBJECTIVES

Power Wheelchair (PWC) with driving assistance module

Comparison of driving performances
Number of collisions
Time to completion

Reduce the number of collisions

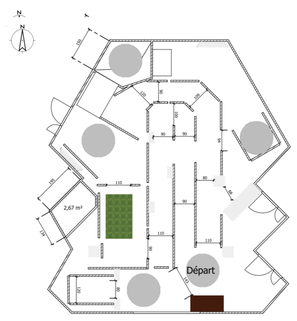
Increase driving safety

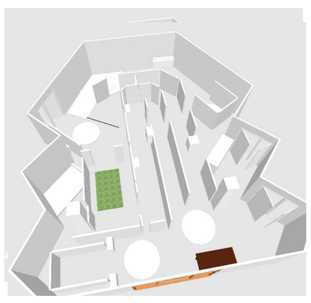
MATERIALS AND METHODS

PROSPECTIVE **MONOCENTRIC** **CONTROLLED** **RANDOMIZED** **SINGLE-BLIND**

Conditions

3 **circuits of increasing complexity** (C1, C2, C3).



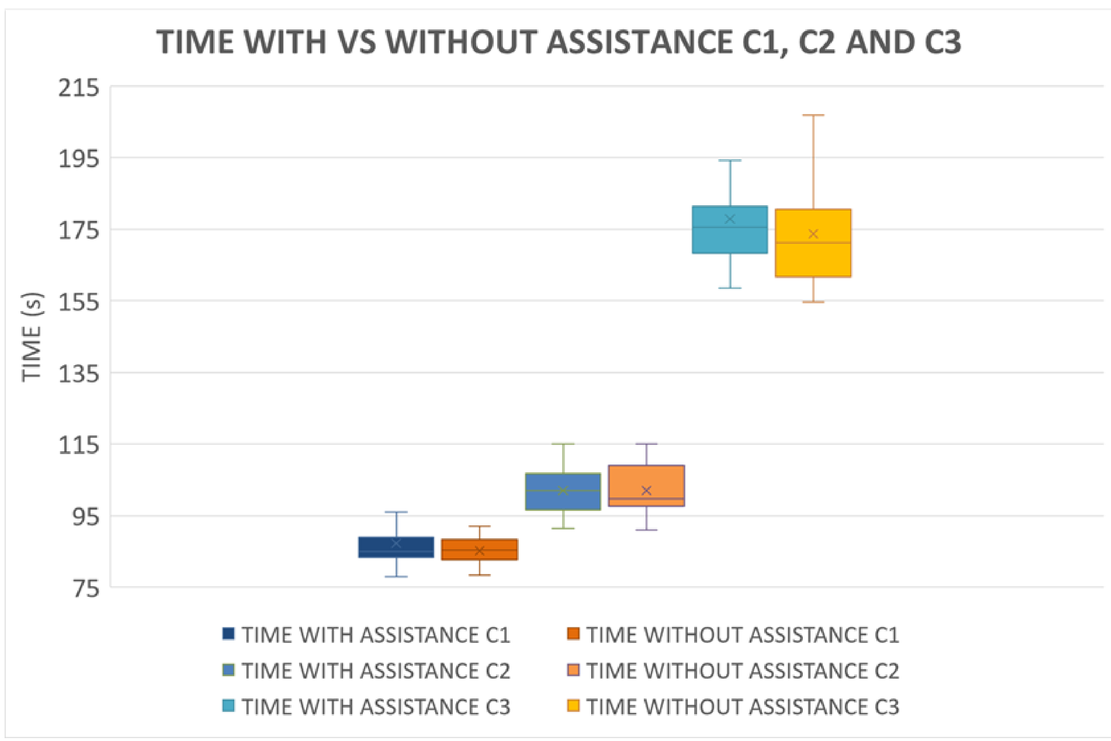


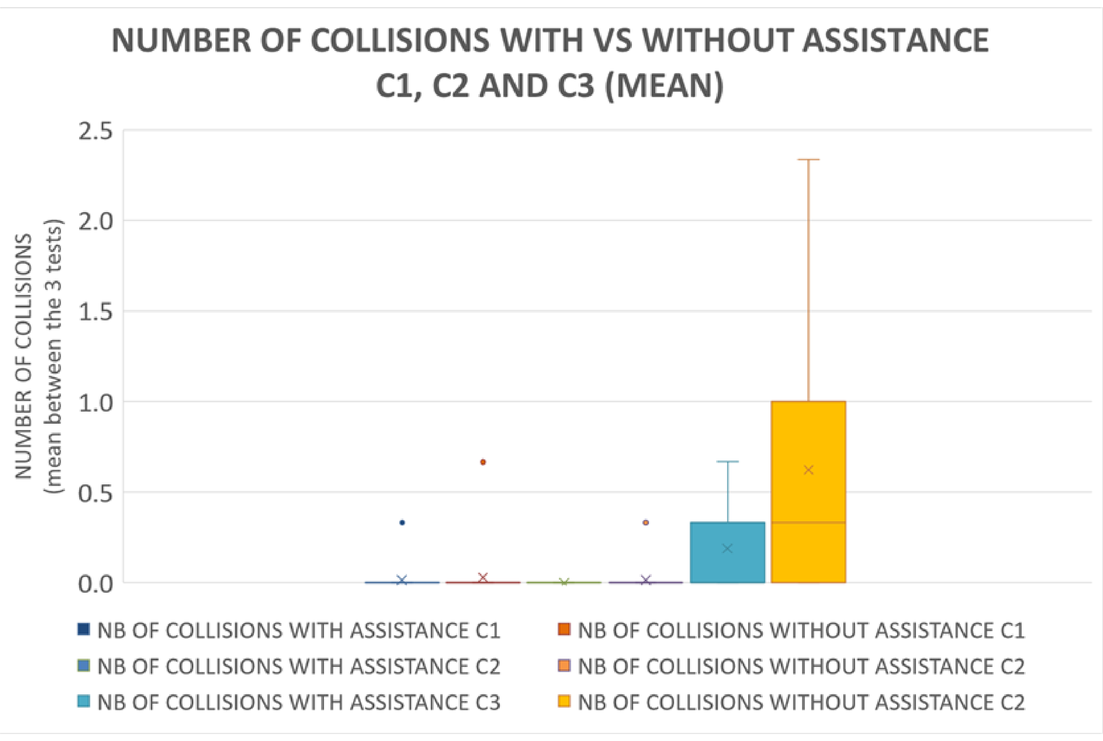
Example of circuit 3 : map, 3D representation and picture

population

23 patients with neurological disabilities who usually use PWC

RESULTS





DISCUSSION - CONCLUSION

- Statistically significant reduction in the number of collisions on the most complex circuit (13 versus 46)
- Significant slowdown due to the activation of the driver assistance module but a real increase of safety.

→ Efficiency of the PWC driver assistance module **in terms of safety without reducing travel speed** in a population of people with disabilities who are usual wheelchair drivers.

Future trials : **tests on the target population** in failure or driving difficulties

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